B.18 PLANETARY PROTECTION RESEARCH

1. Scope of Program

There are numerous areas of research in exobiology that have implications for the prevention of contamination of extraterrestrial environments by terrestrial organisms carried by spacecraft and for understanding the potential hazards associated with possible extraterrestrial organisms that could be brought to Earth by sample-return missions. Research is required to allow NASA to understand the potential for both forward as well as backward contamination, as well as to set standards in these areas for spacecraft preparation and operating procedures, and for returned-sample analysis. Many of these research requirements derive directly from recent National Research Council (NRC) reports on planetary protection requirements for Solar System Exploration missions (see the NRC's Space Studies Board website at http://www.nas.edu/ssb/ for online reports and a list of publications).

Complementing the research program in exobiology, the planetary protection element solicits research in the following areas (currently without priority):

- Modern molecular analytical methods to detect, classify, and/or enumerate the widest possible spectrum of Earth microbes on spacecraft (surfaces and in bulk materials, especially at low densities) during assembly and launch processing, particularly microbes capable of surviving space conditions;
- Methods, procedures, and conditions for spacecraft sterilization that are compatible with spacecraft materials;
- Methods, procedures, and conditions for sample sterilization that largely preserve sample information, including in collected dust samples; and
- Characterizations of the limits of life, including biological and/or planetary environmental studies of the potential for organisms to survive and reproduce in conditions present on bodies such as the surface or subsurface of Mars (potentially in the presence of a perennial heat source brought from Earth), on Europa and other Jovian satellites, asteroids, or comets, or in conditions on or in robotic spacecraft en route to these bodies.

It should be noted that the planetary protection requirements of NASA's rapidly evolving Solar System Exploration programs may affect the priorities for funding among these topics at any time.

Finally, note that to enable the NASA Office of Space Science to properly evaluate the relevance of proposals submitted to its programs, as well as track its progress towards achieving its goals as mandated by the Government Performance Review Act (GPRA), all research supported by NASA's programs must now demonstrate its relationship to NASA Goals and Research Focus Areas (RFAs) as stated in the latest version of its Strategic Plan (follow links from the Web site http://spacescience.nasa.gov/); see also the discussion in Section I of the *Summary of Solicitation* of this NRA. Therefore, all proposers to this program element are asked to state their perception of this relevance in

terms of the Goals, Science Objectives, and RFAs given in Table 1 found in the *Summary of Solicitation*. In particular, proposals to this program element may relate to RFAs 2(a) and (b), and 3(a) and (b) of Goal II for Solar System Exploration. The appropriate place for this statement of relevancy is in the introduction to the proposal's *Scientific/Technical/Management* section (see Section 2.3.5 in the *Guidebook for Proposers*). The index numbers in this table may be used to identify a specific RFA, for example, "Goal I, Sun-Earth Connection Theme, RFA 1(c)" or "Goal II, Astronomical Search for Origins, RFA 3(b)."

2. Programmatic Information

Proposals are sought for new projects in planetary protection that are not within the scope of the Exobiology Program. Proposals submitted in response to this program element should be for new work that is not currently supported by NASA, as well as for successor proposals that seek to extend to their next logical phase those tasks doing research in Planetary Protection that are currently funded but whose periods of performance will expire in 2004 through mid-2005. Periods of performance from one to three years may be proposed as appropriate to the nature of the contemplated research. Approximately $300-500K per year of total funding is expected to be available to support three to five research tasks proposed in response to this solicitation.

Progress reports for funding the second or subsequent years of research, for previously approved multiple year awards, will be considered separately and should be sent directly to the NASA Planetary Protection Officer at least 60 days before their funding anniversary date.

IMPORTANT INFORMATION

As discussed in the *Summary of Solicitation* of this NRA, the Office of Space Science (OSS) now uses a unified set of instructions for the preparation and submission of proposals given in the document entitled *NASA Guidebook for Proposers Responding to NASA Research Announcement - 2004* (or *NASA Guidebook for Proposers* for short) that may be accessed by opening http://research.hq.nasa.gov/ and linking through "Helpful References," or by direct access at http://www.hq.nasa.gov/office/procurement/nraguidebook/. Section IV(b) of this NRA's *Summary of Solicitation* contains the Web address relevant to the electronic submission of a Notice of Intent (NOI) to propose and a proposal's *Cover Page/Proposal Summary/Budget Summary*, as well as the mailing address for the submission of the hard copies of a proposal.

Questions concerning this program element may be directed to the Program Officer:

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